



Attitudes towards digital treatment for depression: A European stakeholder survey



Naira Topooco^{a,*}, Heleen Riper^b, Ricardo Araya^c, Matthias Berking^d, Matthias Brunn^e, Karine Chevreur^f, Roman Cieslak^g, David Daniel Ebert^d, Ernestina Etchmendy^h, Rocío Herreroⁱ, Annet Kleiboer^b, Tobias Krieger^j, Azucena García-Palaciosⁱ, Arlinda Cerga-Pashoja^c, Ewelina Smoktunowicz^g, Antoine Urech^j, Christiaan Vis^{b,k}, Gerhard Andersson^{a,l}, On behalf of the E-COMPARED consortium:

^a Department of Behavioural Sciences and Learning, Linköping University, Linköping, Sweden

^b Department of Clinical, Neuro-, & Developmental Psychology, Faculty of Behavioural and Movement Sciences, VU Amsterdam, The Netherlands

^c Department of Population Health, London School of Hygiene & Tropical Medicine, London, United Kingdom

^d Department of Clinical Psychology and Psychotherapy, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen, Germany

^e ECEVE, Inserm, Univ. Paris Diderot, Paris, France

^f URC Eco Ile-de-France (AP-HP), Paris, France

^g Department of Psychology, SWPS University of Social Sciences and Humanities, Warszawa, Poland

^h CIBER Fisiopatología Obesidad y Nutrición (CIBEROBN), Instituto Salud Carlos III, Spain

ⁱ CIBER Fisiopatología Obesidad y Nutrición (CIBEROBN), Instituto Salud Carlos III, Universitat Jaume I, Castellón, Spain

^j Department of Psychology, University of Bern, Bern, Switzerland

^k EMGO + Institute, VU Medical Centre Amsterdam, VU Amsterdam, The Netherlands

^l Department of Clinical Neuroscience, Psychiatry Section, Karolinska Institutet, Stockholm, Sweden

ARTICLE INFO

Article history:

Received 9 August 2016

Received in revised form 5 January 2017

Accepted 6 January 2017

Available online 25 January 2017

Keywords:

Depression

E-mental health

Comparative effectiveness research

Digital treatment

Internet-delivered

Blended treatment

ABSTRACT

Background: The integration of digital treatments into national mental health services is on the agenda in the European Union. The E-COMPARED consortium conducted a survey aimed at exploring stakeholders' knowledge, acceptance and expectations of digital treatments for depression, and at identifying factors that might influence their opinions when considering the implementation of these approaches.

Method: An online survey was conducted in eight European countries: France, Germany, Netherlands, Poland, Spain, Sweden, Switzerland and The United Kingdom. Organisations representing government bodies, care providers, service-users, funding/insurance bodies, technical developers and researchers were invited to participate in the survey. The participating countries and organisations reflect the diversity in health care infrastructures and e-health implementation across Europe.

Results: A total of 764 organisations were invited to the survey during the period March–June 2014, with 175 of these organisations participating in our survey. The participating stakeholders reported moderate knowledge of digital treatments and considered cost-effectiveness to be the primary incentive for integration into care services. Low feasibility of delivery within existing care services was considered to be a primary barrier. Digital treatments were regarded more suitable for milder forms of depression. Stakeholders showed greater acceptability towards blended treatment (the integration of face-to-face and internet sessions within the same treatment protocol) compared to standalone internet treatments. Organisations in countries with developed e-health solutions reported greater knowledge and acceptability of digital treatments.

Conclusion: Mental health stakeholders in Europe are aware of the potential benefits of digital interventions. However, there are variations between countries and stakeholders in terms of level of knowledge about such interventions and their feasibility within routine care services. The high acceptance of blended treatments is an interesting finding that indicates a gradual integration of technology into clinical practice may fit the attitudes and needs of stakeholders. The potential of the blended treatment approach, in terms of enhancing acceptance of digital treatment while retaining the benefit of cost-effectiveness in delivery, should be further explored.

Funding: The E-COMPARED project has received funding from the European Union Seventh Framework Programme (FP7/2007–2013) under grant agreement no. 603098.

© 2017 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

* Corresponding author at: Department of Behavioural Sciences and Learning, Linköping University, SE-581 83 Linköping, Sweden.
E-mail address: Naira.Topooco@liu.se (N. Topooco).

1. Introduction

Depression is currently a leading cause of years lived with disability (YLD) in 146 countries (Vos et al., 2015) and Major Depressive Disorder is expected to become the greatest contributor to the global burden of disease (WHO, 2008). Treatment resources are insufficient and it is an international priority to increase the coverage of interventions for depression (WHO, 2013).

Experts emphasize that the digital technology has the potential to improve access to care for mental disorders (Andersson, 2016). Digital psychological interventions are under development and testing in Australia (Perini et al., 2009), Canada (Hadjistavropoulos et al., 2016), The United States (Andersson, 2016; Mohr et al., 2013) and a range of European countries (Andersson et al., 2005; Berger et al., 2011; Buntrock et al., 2016; O'Mahen et al., 2014; Ruwaard et al., 2009). The digital treatment approach involves adapting standard face-to-face protocols into computerised self-help material that is delivered over a set time period either as pure self-help program or alongside brief therapist support. In this way the treatments become highly automated and geographically independent, which positively impact therapist capacity and patient access. Currently, digital programs that are based on Cognitive Behavioural Therapy (internet-based CBT or ICBT) have been evaluated in > 100 controlled trials with promising results for several mental and somatic disorders (Andersson, 2016). The reported clinical effects for therapist-supported ICBT for depression are large and stable over a number of trials (Cuijpers et al., 2015). In direct comparison to face-to-face treatment effect sizes are similar (Andersson et al., 2014; Andersson et al., 2016). A relatively newly developed but increasingly applied route in the field of digital treatment is 'blended treatment' (BT) (Wentzel et al., 2016). In this approach self-help material is blended with face-to-face sessions (reduced in number compared to standard treatment) (Kleiboer et al., 2016). The blended treatment emphasises the integration of standard and digitalized modalities and the advantages this brings for both the therapist and the patient. Face-to-face sessions enable more extensive therapist support and improved monitoring of the patient's wellbeing in comparison to standalone ICBT. As the standardized parts of treatment are delivered online it also means that sessions can be used to address and tailor the treatment to individual patient's needs. The standardized components can be delivered online, which for the patient means unlimited access to treatment and less demands in terms of travel and costs (Romijn et al., 2015). It has been suggested that BT can be an alternative to ICBT (the most common treatment for mild to moderate depression), for example in specialized treatment services and for patients with more severe symptomatology (Kleiboer et al., 2016). Examples of BT designs that have been evaluated with promising result are unguided self-help reading material combined with face-to-face sessions, and digital therapy as a partial replacement of face-to-face sessions (Ly et al., 2015; Wentzel et al., 2016).

In some countries like Australia, Canada and Sweden there are examples of ICBT programmes being transferred from research settings into utilisation within regular care services (Andersson and Hedman, 2013; Hadjistavropoulos et al., 2014; Titov et al., 2016). An integration of ICBT treatment into national health services is now on the agenda in the European Union (Vis et al., 2015). This is reflected in several ongoing European research and funding programs (E-COMPARED, Joint action and Wellbeing, Horizon 2020). Effectiveness-research to establish clinical and cost-benefits of ICBT in real world settings has been conducted (e.g. Hadjistavropoulos et al., 2014; Hedman et al., 2014; Ruwaard et al., 2012; Titov et al., 2016) and is currently researched in different European settings (Kemmeren et al., 2016; Kleiboer et al., 2016). Therefore, it is of importance to assess the views of all stakeholders that would be directly involved or affected by the implementation of ICBT treatments such as government bodies, care providers, professionals, patients and funders. Limited research exists that investigates current knowledge, attitudes and expectations of digital treatment. This survey was conducted with the aim to explore European mental health care stakeholders' knowledge and acceptance of ICBT

and BT, and their expectations when considering integration of digital treatments into regular care services. The survey was conducted in the context of the wider research project E-COMPARED, that was initiated to provide mental healthcare stakeholders with evidence-based information about the clinical and cost-effectiveness of digital treatments for depressive disorders.

2. Material and methods

2.1. Background

This study presents findings on European stakeholders' self-reported knowledge and attitudes towards ICBT and BT in treatment of adult depression. The results derive from a European online survey that was conducted by the E-COMPARED project between March to June 2014. Six survey items that assessed stakeholders' views on ICBT and BT were selected to be discussed in this paper. The original survey was more comprehensive and also assessed views on standard pharmacological and therapeutic treatments for adult depression. The survey in its full length can be found in Appendix 2.

2.2. Survey development and design

No prior surveys existed on stakeholder's views on standard treatments and digital treatments for depression, therefore this survey was conducted by the E-COMPARED consortium. Initially the consortium jointly developed an English version of the survey, thereafter consortium members translated the survey into their first languages (French, German, Dutch, Polish, Spanish, Swedish). Consortium members that adapted the survey were involved in the development of the original version and the process did not include formal back-translation.

The full survey was comprised of 40 questions that assessed views on standard treatments and novel digital treatments (ICBT and BT) on adult depression. The survey covered four thematic areas: i) knowledge of treatments, ii) attitudes towards treatments, iii) acceptability (recommendation) of treatments and iii) near future expectations of treatments. The survey questions were presented in the form of six-point scales (0–5), yes/no options and as ranking alternatives. Beyond standard response options the survey allowed free text comments and the alternative "not applicable". ICBT and BT were not expected to be familiar to respondents and these treatments were presented in explanatory terms. Table 1 shows how the treatment concept and survey questions on ICBT and BT were presented to participants. See Appendix 1 for original survey items. The aim was to optimise understanding (attributing the same meaning to the terms) and the validity of the outcome. Participants were asked fill out the survey on behalf of their organisation and to contribute opinions on digital treatment regardless if these treatments were currently accessible in their country.

2.3. Included countries

The survey was conducted in France, Germany, Netherlands, Poland, Spain, Sweden, Switzerland and The United Kingdom. The selection of countries was made a priori to the survey on the basis of the constellation of the E-COMPARED consortium, which in turn was composed to reflect the diversity in Europe in terms of health care infrastructure and level of e-mental health implementation. A distinction of participating countries (as 'frontrunners', 'learners' and 'followers') was made a priori to the survey. The Netherlands, Sweden, and the United Kingdom (UK) has in relation to other European countries come far in terms of inclusion of e-health and presence of digital treatment approaches, therefore these countries were considered 'frontrunners' in the field. In Germany, Spain and Switzerland, health technologies are currently evolving and these countries were categorized as 'follower' countries. In France and Poland the current experience and practice of e-health is limited, and these countries were considered 'learner' countries.

Table 1
Overview of analysed survey items.

Survey theme	Presented item	Item design
Knowledge of treatments (ICBT)	"To what extent does your organisation have knowledge about internet-based psychotherapy (referred to as online therapy and web-based treatment) as a treatment tool for adult depression?"	Six-point scale: 0 = no knowledge at all, to 5 = very good knowledge Opt out option "does not apply"
Attitude towards treatments (ICBT)	"Is your organisation discussing and/or proclaiming internet-based psychotherapy as a future enhancement in mental health care?"	Single-choice question: "yes", "partly", "no", "does not apply".
Acceptance of treatments (ICBT, BT)	"Do you/Would your organisation recommend: 1) stand-alone treatment full psychotherapy program for computer/tablet/smartphone, with online educational material and communication with health care professional?" (ICBT) 2) "Traditional face-to-face treatment with the addition of a web-based platform and digital tools for support, with the aim of reducing the number of face-to-face sessions while maintaining the same treatment quality" (BT)	Single-choice question: "yes", "no", "does not apply".
Expectations of treatments (ICBT)	"What does your organisation expect to be the most important incentive/barrier for integrating internet-based psychotherapy as a stand-alone treatment for adult depression in your country's health care system?"	Choose alternative from presented list.

2.4. Included stakeholders

The aim was to identify organisations (stakeholders) that were involved in the delivery of depression treatment to the adult population. In order to identify relevant stakeholders, consortium members compiled a list of organisations that were active in the field of mental health care and the organisation categories that were present in all participating countries were chosen as stakeholders to target for the survey. The selected stakeholder groups were i) government bodies ii) care providers and professionals, iii) researchers at universities and institutes, iv) service funders, v) technology developers/providers of digital services within mental health, and vi) organisations representing patients/users. A description and overview of targeted stakeholder categories is presented in Fig. 1.

2.5. Recruitment to the survey

Consortium partners recruited stakeholders in their respective country. The recruitment guideline was to recruit at least 1–3 organisations from each stakeholder category. No higher limit was set. Based on the stakeholder categories, consortium members identified organisations and invited their representatives to participate in the survey via email. The email briefly presented the E-COMPARED project and the request

to participate in the survey. It contained a link that directed to the online survey. On the survey start-page the individual was instructed to provide name and organisation, and to answer the survey on the behalf of the organisation (and not as an individual agent). Fig. 2 illustrates the start-page as presented to participants in the survey.

3. Analysis

Five survey items that assessed stakeholder's views on ICBT and BT were selected for this paper. The survey data was analysed by using descriptive statistics, Kruskal-Wallis tests, χ^2 and analysis of variance (ANOVA). Post-hoc tests were used to test differences in responses between stakeholder categories and countries (frontrunner countries versus other countries, Germany versus other countries). The completion rate varied between items, therefore, sample sizes are continuously presented.

4. Results

4.1. Enrolment

In total 764 organisations was contacted and 175 returned the questionnaire, corresponding to a 23% response-rate. The number of targeted organisations and response rates varied between countries (Poland 29/

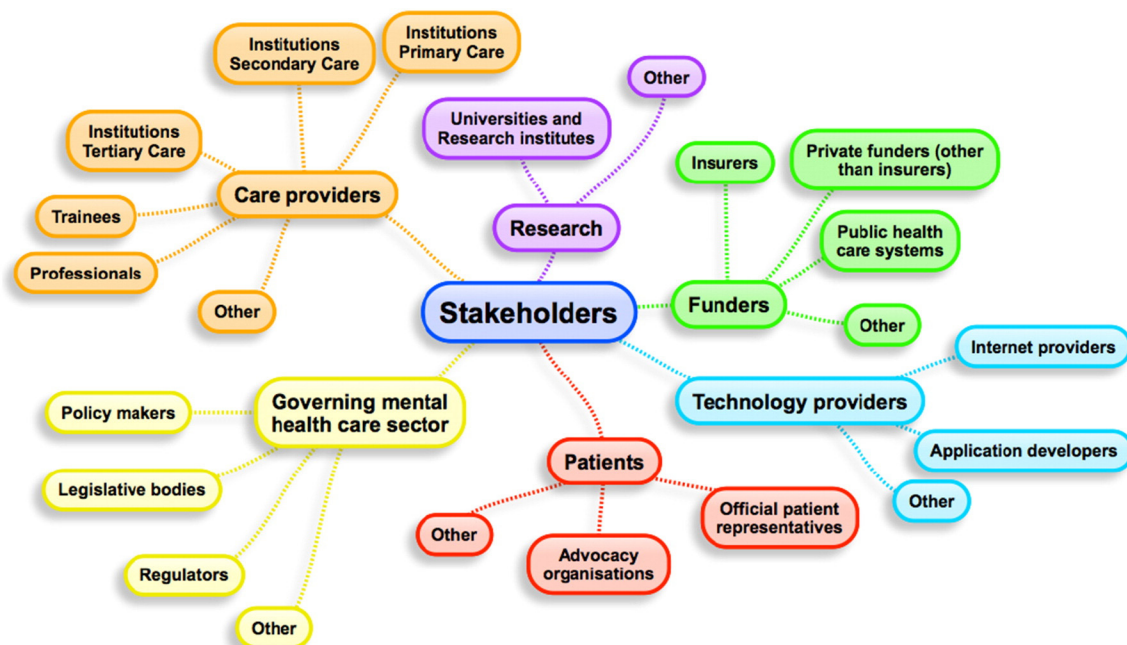


Fig. 1. Targeted stakeholder groups.

Introduction

Welcome to the E-COMPARED project!

You are about to participate in a Europe-wide online survey focusing on the current state of the art treatment for depression in Europe. This survey is conducted in eight European countries. Your organisation has been chosen as one of the most important stakeholders in your country, and your response to this survey is very valuable to us. E-COMPARED wish to collect stakeholders' views on the treatment for depression. The questions concern your organisation's knowledge, attitudes, behaviours and expectations with regard to regular depression treatment and Internet-based treatments for adult depression.

- You answer the questions on behalf of the organisation you represent and the situation in your country
- You do not have to seek additional information to answer any question
- When the topic is depression we always mean adult depression episodes (mild to severe)
- Since the questionnaire is administrated in several European countries, all questions may not apply to your organisation or country. If so, please check the "does not apply" box.

Thank you for participating in the survey. Your answers are very valuable to us and will greatly influence the continued research process of the E-COMPARED project in Europe. If you have questions regarding your organisations participation, please contact us: naira.topooco@liu.se

[Click here to read more information about the E-COMPARED project.](#)

The survey consists of 4 pages and takes approximately 10-15 minutes to complete. If the survey is interrupted in some way before you are done you can click on the same original link again to get to the same spot in the survey which you were previously on.

To start the questionnaire, please fill in the required short information below and then press the "Next" button.

In 2010, 30 million Europeans were affected by depression and this number is still increasing. Half of the Europeans in need of mental health care for depression do not have access to care services, do not always receive evidence-based treatments, are confronted with long waiting lists or high care expenditures. Internet-based treatment has the potential to address the drawbacks of standard care, delivering depression treatment of high quality at affordable prices.

E-COMPARED (European-COMPARative Effectiveness research on online Depression) is a 3-year Europe-wide health research project funded by the European Commission.

The project focuses on evaluating regular and internet-based treatment for adult depression, and has the following aims:

- Evaluating EU mental health policies/guidelines for standard and internet-based care for depression in European countries
- Comparing clinical efficacy and cost-effectiveness of internet-based treatment and regular treatment
- Carrying out randomized controlled trials to study internet-based depression treatment
- Predicting which patient groups could benefit from internet-based treatment
- Developing evidence-based recommendations on how internet-based depression treatment could be integrated into care systems

E-COMPARED is a multidisciplinary project (psychology, HTA, ICT, health care) and its members have front-runner positions in internet-based treatments for common mental health disorders.

Public information:

cordis.europa.eu/projects/rcn/111382_en.html
www.e-compared.eu

Your name and title: *

Fig. 2. Information on the E-COMPARED survey start page.

300, United Kingdom 4/24, France 4/28, Germany 58/232, Switzerland 13/49, Netherlands 22/77, Sweden 23/31, Spain 22/23), see Fig. 3 for response-rates. The participating stakeholders represented all countries and included 88 organisations in the category of providers and professionals, 27 government bodies, 26 research institutions (e.g. universities and institutes), 14 organisations that represented patients/service-users, 11 organisations within service funding and 9 organisations that represented technology provider/developers. On subgroup level Germany had most responders (33% of the total sample) and the most well represented stakeholder group was care providers/professionals (50% of the total sample). See Table 2 for distributions on country and stakeholder level. Respondents were evenly distributed between associations operating on national (38%), regional (34%) and local (28%) level.

4.2. Knowledge

Stakeholders' self-reported knowledge of internet-based treatment for depression is presented in Table 3. Organisations were asked to indicate their knowledge of any kind of internet-based psychological treatment even if not currently accessible in their country. Respondents self-

reported their knowledge of digital treatment (ICBT) on a six-point scale (0–5). The total sample reported a moderate level of knowledge ($M = 2.7$). There were differences between stakeholder categories, with technology developers reporting higher level of knowledge ($M = 4.3$) compared to government bodies ($M = 1.8$) and care providers ($M = 2.6$) (Tukey $p < 0.027$ – 0.001).

4.3. Activity

Stakeholders' activity on the topic of digital treatments for depression (ICBT) is reported in Table 4. Respondents were asked to indicate whether their organisation in some way discussed or promoted digital treatment for depression, and they replied by selecting "yes", "partly" or "no". Considering the whole sample, the majority of organisations (64%) reported that their organisation to some extent discussed or supported digital treatment. There were differences between stakeholder categories (Kruskal-Wallis test, $p < 0.001$), characterised by lower activity among government bodies compared to care providers, researchers and technology providers.

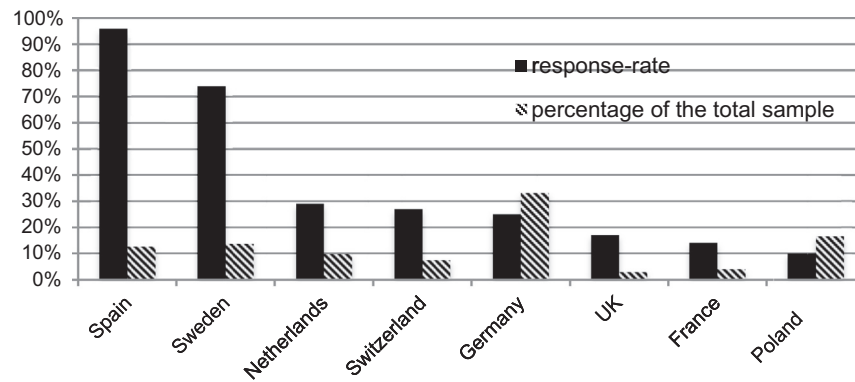


Fig. 3. Response rates and percentage of the total sample for participating countries.

4.4. Acceptance of treatments

Stakeholders' acceptance of ICBT and BT respectively is presented in Table 5. Organisations were asked to indicate whether in their opinion, ICBT and BT could be recommended for the treatment of adult depression. They replied by indicating "yes", "no", or "not applicable". In the total sample nearly half of respondents (47%) recommended standalone ICBT for mild depression. For moderate and severe depression, the recommendation-rates were 16% and 2% respectively. BT was recommended by the majority of stakeholders for mild (70%) and moderate (57%) depression and by 27% for severe depression. There were differences between groups for both ICBT and BT, characterised by government bodies recommending treatments to a lower degree than patient/service-users, caregivers and research institutions (Kruskal-Wallis, $p < 0.05$ – 0.002). To further explore the difference in acceptance for ICBT and BT, free text comments made throughout the survey were assessed (also for items not discussed in this paper). No comments were made on BT. Comments made on possible disadvantages on ICBT ($n = 52$) most frequently highlighted concerns about clinical effect and aspects related to the absence of direct contact between therapist and patient. Some examples of these comments are: "impersonal, no direct eye contact", "little emotion possible", "the personal relationship with the therapist is lost, this is only possible via face-to-face", "lack of personal contact between patient and caregiver", "does not adequately address comorbidity/crisis/suicide risk".

4.5. Expectance of treatments

Stakeholders' expectations regarding future integration of internet-based treatments into conventional practices, in terms of incentives and barriers, are reported in Table 6. According to all stakeholder groups the most important reason for the implementation of ICBT into existing care services was the reduced cost of treatment (33%). More rapid patient access to treatment was ranked the second most important incentive among all stakeholder groups, with the exception of technology businesses. Among all respondents the most important barrier for

implementation was the perception that their current care system was not ready for service delivery of ICBT (21%). On the subgroup level the responses differed, with stakeholder groups reporting limited internet access/literacy (service-funders), lack of clinical effectiveness (patient/service-users), and negative attitudes from patients and professionals (government bodies) as the main barriers to implementation. There were 23 comments on barriers. Caregivers provided most comments ($n = 15$) and most frequently highlighted the negative aspects of therapeutic alliance, clinical effect and patient commitment, and of implementation aspects (cost and budgeting, training of staff). Comments from the other groups were on the same topics and also highlighted potential fear of competition among care giving professions and barriers in infrastructure (internet access).

4.6. Factors associated to stakeholder attitudes

Stakeholders from frontrunner countries (Netherlands, Sweden and United Kingdom) were found to self-report higher knowledge of ICBT ($M = 3.4$, $SD = 1.3$) compared to stakeholders in other countries ($M = 2.5$, $SD = 1.7$) (χ^2 , $p \leq 0.05$). Organisations that reported discussing digital treatments recommended ICBT and BT to a higher degree compared to other organisations (χ^2 , $p < 0.05$ – 0.001), with the exception of ICBT for severe depression. German responders represented 33% of the total sample and post-hoc tests (χ^2 , $p < 0.05$) showed that these organisations indicated significant lower knowledge of ICBT ($M = 2.2$), and lower activity on digital treatments (45%) compared to the rest of the sample (73%). No significant differences were reported on the other topics.

5. Discussion

5.1. Summary of findings

This survey is the first to report mental health stakeholder's attitudes towards internet-based treatment (ICBT) and blended treatment (BT) for adult depression on European level. The results showed that stakeholder's

Table 2
Sample distribution, country and stakeholder level.

Country × stakeholder N, (%)	Total sample (N = 175)	Care provider (N = 88)	Research Inst. (N = 26)	Governing body (N = 27)	Patient org. (N = 14)	Tech. provider (N = 9)	Funder (N = 11)
Total sample	175 (100)	88 (50.3)	26 (14.9)	27 (15.4)	14 (8.0)	9 (5.1)	11 (6.3)
France	7 (4.0)	5	–	–	2	–	–
Germany	58 (33.1)	26	2	19	5	1	5
Netherlands	17 (9.7)	10	5	–	–	1	1
Poland	29 (16.6)	18	6	–	4	1	–
Spain	22 (12.6)	8	7	2	–	3	2
Sweden	24 (13.7)	13	1	4	1	3	2
Switzerland	13 (7.4)	7	3	2	–	–	1
United Kingdom	5 (2.9)	1	2	–	2	–	–

Table 3
Stakeholders self-reported knowledge of internet-based treatment (ICBT) for adult depression, European level.

Knowledge ^a (m, SD)	Total sample (N = 168)	Care providers (N = 88)	Research Inst. (N = 26)	Governing body (N = 21)	Patient org. (N = 14)	Tech. providers (N = 9)	Funders (N = 10)
Reported knowledge ^b	2.7 (1.6)	2.6 (1.6)	2.9 (1.4)	1.8 (1.9)	2.6 (1.4)	4.3 (1.0)	3.3 (1.3)

Rated on a six-point scale: 0 = no knowledge at all, to 5 = very good knowledge.

^a Original wording: "To what extent does your organisation have knowledge about internet-based psychotherapy (referred to as online therapy and web-based treatment) as a treatment tool for adult depression?"

^b Significant differences among groups: $p < 0.01$. Respondents that indicated "does not apply" (total N = 7) were excluded.

who responded to the survey had moderate knowledge of ICBT and that a majority (64%) discussed ICBT for depression or were in some other way engaged with the topic. In terms of implementing ICBT into regular care services, stakeholders considered improved cost-efficiency to be the main advantage, and low feasibility of delivery within present care systems to be the primary barrier. ICBT and BT had higher level of acceptance for milder forms of depression. A comparison of ICBT and BT showed that the acceptance was considerably higher for BT, and this result was consistent for all stakeholder subgroups. On group level, it was also found that government bodies indicated lesser knowledge and held more conservative attitudes towards ICBT compared to other stakeholders. Organisations from countries considered frontrunners in e-mental health reported greater knowledge and more positive attitudes towards digital treatments compared to other organisations.

5.2. Perceived advantages and barriers

Stakeholders' opinion of cost-effectiveness being the primary advantage of ICBT is in line with advantages argued in scientific reports (Andersson, 2014). This reflects the views of a range of stakeholders in countries that are diverse in terms of care infrastructure and e-health. Consequently, we may infer that there exists a broad agreement on the rationale for delivery of digital treatments for depression. However, many stakeholders also indicated that they did not expect current care systems to be ready for an integration of ICBT—stakeholders expected this to be primary barrier for implementation. On stakeholder group level the results further revealed that expectations in some cases seemed to be based on assumptions about other stakeholder groups. For example, government bodies expected negative attitudes from patients and professionals to be a primary barrier for implementation. This belief was supported by patient and caregiver reports of concerns about limitations of internet use, ethical issues, and clinical effectiveness of digital treatments. Moreover, the barriers considered by caregivers and patient organisations are aspects that are to some extent the responsibility of researchers and technology providers. The results show that there is a variation in perceived barriers between stakeholders, indicating the need for future multi-stakeholder consultations on digital treatments to avoid biased findings.

5.3. Result on acceptance of digital treatments

The acceptance of digital treatments varied with the severity of depression. ICBT was perceived as suitable for mild depression only, even

though ICBT is well researched and has repeatedly shown to be an effective treatment for adult depression, even for severe stages (Meyer et al., 2015; Richards and Richardson, 2012). The significantly higher acceptance for BT (a relatively novel treatment approach yet to be evaluated in clinical trials) indicates that the scepticism presented for ICBT may not only be explained by lack of knowledge about both the ICBT concept or the evidence-base for the approach. The reasons for the reported difference in the level of acceptance was not directly assessed in this survey, however a review of free text comments made about ICBT throughout the survey revealed opinions that are similar to those previously reported by mental health professionals and students (Mitchell and Gordon, 2007; Stallard et al., 2010). ICBT is perceived as 'impersonal', and concerns in this survey were in most cases associated with the elimination of face-to-face interaction between patient and therapist. The results indicate that attitudes do not seem to change in pace with new digital developments, considering the increased everyday use of technology that is also being widely applied in mental health settings (Patrick et al., 2016). The comparison of ICBT and BT was made for the first time in the E-COMPARED survey and the results are interesting. The readily acceptance for BT raise the questions as to what extent do stakeholders attribute treatment outcomes to objectives achieved during face to face meetings, and if blended treatment approaches may present a middle path for digital treatments that can be considered more acceptable. Of interest is also to explore if the attitudes for ICBT compared to BT are similar for conditions that are not associated with suicide risks (for example anxiety disorders).

5.4. Results on stakeholder group and country level

Explorations on sub-group level revealed that government bodies self-reported significantly less knowledge and activity on ICBT compared to other stakeholder groups. Given that these organisations hold high-level influence and several of the countries targeted in the survey have recently revised their mental health policies to be more inclusive of e-health, the results were somewhat unexpected. Possibly the responses from this group reflect that for many institutional bodies it is a prerequisite that the effect of ICBT has been proven in real world settings before moving forward with dissemination initiatives. Future dissemination activities may consider directing further attention to this stakeholder group.

Patient organisations showed the least level of acceptance for ICBT as treatment for depression, and were concerned about the clinical and ethical aspects of treatment. This finding goes against previous reports of patients being more positive towards ICBT than clinicians (Andersson, 2014). A recent study, which explored patients' and clinicians'

Table 4
Stakeholders report on whether their organisation discuss or proclaim internet-based treatment (ICBT), European level.

Activity ^a (%)	Total (N = 159)	Care providers (N = 82)	Research Inst. (N = 22)	Governing body (N = 24)	Patient org. (N = 13)	Tech. providers (N = 8)	Funders (N = 10)
Activity							
Yes ^b (full or partial)*	64.2	64.6	90.9	33.3	61.5	100	50.0
No	20.8	24.4	4.5	29.2	23.1	0	20.0
Does not apply	15.1	11.0	4.5	37.5	15.4	0	30.0

Single-choice question.

* Significant differences among groups: $p < 0.001$.

^a Original wording: "Is your organisation discussing and/or proclaiming internet-based psychotherapy as a future enhancement in mental health care?"

^b The original alternatives "yes" and "partly" have been merged into one category.

Table 5

Stakeholders recommendation of digital treatments, European level.

Recommend (%)	Total (N = 159)	Care providers (N = 82)	Research Inst. (N = 22)	Governing body (N = 24)	Patient org. (N = 13)	Tech. providers (N = 8)	Funders (N = 10)
Standalone Internet-based treatment ^a							
Mild depression*	46.5	39.0	72.7	33.3	38.5	75.0	70.0
Moderate depression*	15.7	13.4	31.8	12.5	0	37.5	10.0
Severe depression**	1.9	2.4	0	0	0	12.5	0
Blended treatment ^b							
Mild depression	69.8	72.0	81.8	45.8	76.9	75.0	70.0
Moderate depression**	57.2	54.9	72.7	29.2	76.9	70.0	70.0
Severe depression**	27.0	22.0	40.9	8.3	38.5	50.0	50.0

Single-choice question: "yes", "no", "does not apply".

Significant differences among groups: * = $p < 0.05$, ** = $p < 0.01$.^a Original wording: "Do you/Would your organisation recommend stand-alone treatment full psychotherapy program for computer/tablet/smartphone, with online educational material and communication with health care professional?".^b Original wording: "Does/Would your organisation recommend traditional face-to-face treatment with the addition of a web-based platform and digital tools for support, with the aim of reducing the number of face-to-face sessions while maintaining the same treatment quality?".

acceptance towards online components in treatment also showed that patients were more accepting than clinicians (van der Vaart et al., 2014). The reason for the findings of the E-COMPARED survey is unknown, but possible explanations may be that the majority of patient organisations came from Germany and Poland (where ICBT is not widely known) or that patient representatives and not actual patients participated in this survey.

Stakeholders from countries with more integrated e-mental health services (Netherlands, Sweden, United Kingdom) had more knowledge of ICBT and were more positive towards ICBT. In these countries, cognitive behaviour therapy is the dominant orientation of psychotherapy, and it is possible that this might interplay with participants' attitudes. In contrast, for example France has a strong tradition of psychodynamic therapies, and French stakeholders rated the relevance and advantage of ICBT as low (result not included in this paper).

6. Strengths and limitations

One of the main strengths of the survey was the purposive sample of stakeholders representing the current status in Europe in terms of care

infrastructure and e-health integration. The survey managed to recruit a large number of organisations that represented all targeted stakeholder categories and countries. A high proportion of participants completed the full survey (82%). Several limitations of the survey need to be considered when interpreting the results. The sample can be considered a convenience sample (introducing recruitment and response biases), and the response-rate varied widely between countries and stakeholder groups. There was no higher limit of participants in recruitment guidelines, which for example is reflected in the high proportion of German responders. Post-hoc test showed that German responders differed from others on the topic of knowledge and activity. Along with the overall limitations in sampling and distribution this may affect the certainty of obtained results. Moreover, many organisations did not accept the invitation (response-rate 23%) and no information on reasons for non-responding was collected. It should also be mentioned that although efforts were made to ensure that survey questions were interpreted the same way across countries and stakeholder categories, and that respondents were repeatedly instructed to answer on behalf of their organisation, there were no formal procedures to control that this was achieved.

Table 6

Incentive/barrier for an implementation of standalone internet-based treatment (ICBT) into care systems, European level.

Incentive/barrier (%)	Total (N = 155)	Care providers (N = 80)	Research Inst. (N = 21)	Governing body (N = 24)	Patient org. (N = 13)	Tech. providers (N = 7)	Funders (N = 10)
Incentive ^a							
Reduced cost of treatment	32.9	27.5	47.6	33.3	38.5	42.9	30.0
Patient access to treatment	21.9	25.0	14.3	20.8	30.8	0	20.0
Patient empowerment	7.1	10.0	0	4.2	7.7	14.3	0
Reduced treatment gap	6.5	6.3	14.3	4.2	0	14.3	0
Clinical effect corresponds to TAU ^b	5.8	7.5	9.5	4.2	0	0	0
Patient convenience	5.2	8.8	0	0	7.7	0	0
None	3.9	3.8	0	4.2	7.7	0	10.0
Other	2.6	0	4.8	0	0	14.3	20.0
Patient adherence	0.6	0	4.8	0	0	0	0
Do not know/does not apply	13.5	11.3	4.8	29.2	7.7	14.3	20.0
Barrier ^a							
Health care system not ready	20.6	22.5	23.8	12.5	23.1	28.6	10.0
Clinical effect inferior to TAU ^b	14.8	16.3	19.0	8.3	30.8	0	0
Professional/patient attitude (neg)	12.3	8.8	14.3	20.8	7.7	14.3	20.0
Limited internet literacy & access	12.2	11.3	14.3	4.2	7.7	14.3	40.0
Other	9.0	10.0	9.5	8.3	0	14.3	10.0
Limited online safety	8.4	10.0	9.5	8.3	7.7	0	0
Not ethical	3.9	2.5	0	4.2	23.1	0	0
Not time/cost effective	3.9	5.0	0	4.2	0	0	0
Cultural barriers	2.6	3.8	4.8	0	0	0	0
None	0.6	1.3	0	0	0	0	0
Do not know/does not apply	11.6	8.8	4.8	29.2	0	28.6	20.0

^a Original wording: "What does your organisation expect to be the most important incentive/barrier for integrating internet-based psychotherapy as a stand-alone treatment for adult depression in your country's health care system?".^b TAU = treatment as usual. Bold prints identify the most frequently reported answer.

7. Implications and future directions

The relevance of e-mental health in relation to the treatment gap is stated in scientific and legislative reports. It is therefore necessary to assess the views of stakeholders that are involved/affected by mental health care provisions. The E-COMPARED survey presents its findings on European stakeholders' opinions (valid for diverse European settings) about digital treatments in terms of their knowledge, acceptance and expectations. The results obtained on knowledge and activity are in line with what we expected. These findings highlight the need to disseminate not only results of clinical and cost effectiveness but also to share best practices and clearly communicate for whom, when and how digital treatments might be applied. The results on acceptance for different treatment approaches (ICBT and BT) provide new information on what may influence stakeholders' attitudes towards technology in treatment. The findings on blended treatment are interesting, and future research can further investigate whether a gradual integration of technology into clinical practice (i.e., blended treatment) might fit with the attitudes and expectations of mental healthcare stakeholders. The results of the E-COMPARED survey can serve as the foundation for future stakeholder dissemination activities in terms of what information should be provided, and what topics may be perceived as relevant by different stakeholder categories.

Acknowledgements and funding

The European Comparative Effectiveness Research on Internet-based Depression Treatment (E-COMPARED) is a project with funding from the European Union Seventh Framework Programme (grant agreement No: 603098). We thank the participating associations/organisations for their contribution. We are grateful to Nicole Beyer, Ernestina Etchemendy, Jean-Baptiste Hazo and Rocío Herrero for translating the questionnaire in various languages and to George Vlaescu for operating the surveys. Results from the E-COMPARED project can be found at www.e-compared.eu.

Appendix 1. Overview of start-page and analysed survey items

Introduction

Welcome to the E-COMPARED project!

You are about to participate in a Europe-wide online survey focusing on the current state of the art treatment for depression in Europe. This survey is conducted in eight European countries. Your organisation has been chosen as one of the most important stakeholders in your country, and your response to this survey is very valuable to us. E-COMPARED wish to collect stakeholders' views on the treatment for depression. The questions concern your organisation's knowledge, attitudes, behaviours and expectations with regard to regular depression treatment and Internet-based treatments for adult depression.

- You answer the questions on behalf of the organisation you represent and the situation in your country
- You do not have to seek additional information to answer any question
- When the topic is depression we always mean adult depression episodes (mild to severe)
- Since the questionnaire is administered in several European countries, all questions may not apply to your organisation or country. If so, please check the "does not apply" box.

Thank you for participating in the survey. Your answers are very valuable to us and will greatly influence the continued research process of the E-COMPARED project in Europe. If you have questions regarding your organisations participation, please contact us: naira.topooco@liu.se

[Click here to read more information about the E-COMPARED project.](#)

The survey consists of 4 pages and takes approximately 10-15 minutes to complete. If the survey is interrupted in some way before you are done you can click on the same original link again to get to the same spot in the survey which you were previously on.

To start the questionnaire, please fill in the required short information below and then press the "Next" button.

In 2010, 30 million Europeans were affected by depression and this number is still increasing. Half of the Europeans in need of mental health care for depression do not have access to care services, do not always receive evidence-based treatments, are confronted with long waiting lists or high care expenditures. Internet-based treatment has the potential to address the drawbacks of standard care, delivering depression treatment of high quality at affordable prices.

E-COMPARED (European-COMPARative Effectiveness research on online Depression) is a 3-year Europe-wide health research project funded by the European Commission.

The project focuses on evaluating regular and internet-based treatment for adult depression, and has the following aims:

- Evaluating EU mental health policies/guidelines for standard and internet-based care for depression in European countries
- Comparing clinical efficacy and cost-effectiveness of internet-based treatment and regular treatment
- Carrying out randomized controlled trials to study internet-based depression treatment
- Predicting which patient groups could benefit from internet-based treatment
- Developing evidence-based recommendations on how internet-based depression treatment could be integrated into care systems

E-COMPARED is a multidisciplinary project (psychology, HTA, ICT, health care) and its members have front-runner positions in internet-based treatments for common mental health disorders.

Public information:
cordis.europa.eu/projects/rcn/111382_en.html
www.e-compared.eu

Your name and title: *

Appendix 2

A6. To what extent does your organisation have knowledge about *internet-based psychotherapy* (also referred to as online therapy and web-based treatment) as a *treatment tool* for adult depression? (Regards your organisation's knowledge of any kind of internet-based psychotherapy not limited to if such treatment is accessible in your country). *

Please choose **only one** of the following:

- ☐ 0 = No knowledge at all
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 = Very good knowledge
- ☐ Does not apply

References

- Andersson, G., 2014. *The Internet and CBT: a Clinical Guide*. CRC Press, Boca Raton, FL.
- Andersson, G., 2016. Internet-delivered psychological treatments. *Annu. Rev. Clin. Psychol.* 12, 157–179.
- Andersson, G., Hedman, E., 2013. Effectiveness of guided Internet-delivered cognitive behaviour therapy in regular clinical settings. *Verhaltenstherapie* 23:140–148. <http://dx.doi.org/10.1159/000354779>.
- Andersson, G., Bergström, J., Holländare, F., Carlbring, P., Kaldö, V., Ekselius, L., 2005. Internet-based self-help for depression: a randomised controlled trial. *Br. J. Psychiatry* 187, 456–461.
- Andersson, G., Cuijpers, P., Carlbring, P., Riper, H., Hedman, E., 2014. Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. *World Psychiatry* 13 (3):288–295. <http://dx.doi.org/10.1002/wps.20151>.
- Andersson, G., Topooco, N., Havik, O., Nordgreen, T., 2016. Internet-supported Versus Face-to-Face Cognitive Behavior Therapy for Depression. (1744–8360 (Electronic)).
- Berger, T., Hämmerli, K., Gubser, N., Andersson, G., Caspar, F., 2011. Internet-based Treatment of Depression: a Randomized Controlled Trial Comparing Guided With Unguided Self-help.
- Buntrock, C., Ebert, D.D., Lehr, D., Smit, F., Riper, H., Berking, M., Cuijpers, P., 2016. Effect of a Web-based guided self-help intervention for prevention of major depression in adults with subthreshold depression: a randomized clinical trial. *JAMA* 315 (17): 1854–1863. <http://dx.doi.org/10.1001/jama.2016.4326>.
- Cuijpers, P., Riper, H., Andersson, G., 2015. Internet-based treatment of depression. *Curr. Opin. Psychol.* 4:131–135. <http://dx.doi.org/10.1016/j.copsyc.2014.12.026>.
- Hadjistavropoulos, H.D., Pugh, N.E., Nugent, M.M., Hesser, H., Andersson, G., Ivanov, M., ... Austin, D.W., 2014. Therapist-assisted Internet-delivered cognitive behavior therapy for depression and anxiety: translating evidence into clinical practice. *J. Anxiety Disord.* 28 (8):884–893. <http://dx.doi.org/10.1016/j.janxdis.2014.09.018>.
- Hadjistavropoulos, H.D., Nugent, M.M., Alberts, N.M., Staples, L., Dear, B.F., Titov, N., 2016. Transdiagnostic Internet-delivered cognitive behaviour therapy in Canada: an open trial comparing results of a specialized online clinic and nonspecialized community clinics. *J. Anxiety Disord.* 42:19–29. <http://dx.doi.org/10.1016/j.janxdis.2016.05.006>.
- Hedman, E., Ljótsson, B., Kaldö, V., Hesser, H., El Alaoui, S., Kraepelin, M., ... Lindefors, N., 2014. Effectiveness of Internet-based cognitive behaviour therapy for depression in routine psychiatric care. *J. Affect. Disord.* 155:49–58. <http://dx.doi.org/10.1016/j.jad.2013.10.023>.
- Kemmeren, L.L., Van Schaik, D.J., Riper, H., Kleiboer, A.M., Bosmans, J.E., Smit, J.H., 2016. Effectiveness of blended depression treatment for adults in specialised mental healthcare: study protocol for a randomised controlled trial. *BMC Psychiatry* 16, 113.
- Kleiboer, A., Smit, J., Bosmans, J., Ruwaard, J., Andersson, G., Topooco, N., ... Riper, H., 2016. European COMPARative effectiveness research on blended depression treatment versus treatment-as-usual (E-COMPARED): study protocol for a randomized controlled, non-inferiority trial in eight European countries. *Trials* 17 (1):387. <http://dx.doi.org/10.1186/s13063-016-1511-1>.
- Ly, K.H., Topooco, N., Cederlund, H., Wallin, A., Bergström, J., Molander, O., et al., 2015. Smartphone-supported versus full behavioural activation for depression: a randomised controlled trial. *PLoS One* 10, e0126559.
- Meyer, B., Bierbrodt, J., Schröder, J., Berger, T., Beevers, C.G., Weiss, M., ... Klein, J.P., 2015. Effects of an Internet intervention (Depixis) on severe depression symptoms: Randomised controlled trial. *Internet Interv.* 2 (1):48–59. <http://dx.doi.org/10.1016/j.invent.2014.12.003>.
- Mitchell, N., Gordon, P.K., 2007. Attitudes towards computerized CBT for depression amongst a student population. *Behav. Cogn. Psychother.* 35 (04):421–430. <http://dx.doi.org/10.1017/S1532465807003700>.
- Mohr, D.C., Duffecy, J., Ho, J., Kwasny, M., Cai, X., Burns, M.N., Begale, M., 2013. A randomized controlled trial evaluating a manualized TeleCoaching protocol for improving adherence to a web-based intervention for the treatment of depression. *PLoS One* 8 (8), e70086. <http://dx.doi.org/10.1371/journal.pone.0070086>.
- O'Mahen, H.A., Richards, D.A., Woodford, J., Wilkinson, E., McGinley, J., Taylor, R.S., Warren, F.C., 2014. Netmums: a phase II randomized controlled trial of a guided Internet behavioural activation treatment for postpartum depression. *Psychol. Med.* 44 (8):1675–1689. <http://dx.doi.org/10.1017/S0033291713002092>.
- Patrick, K., Hekler, E.B., Estrin, D., Mohr, D.C., Riper, H., Crane, D., ... Riley, W.T., 2016. The pace of technologic change: implications for digital health behavior intervention research. *Am. J. Prev. Med.* 51 (5):816–824. <http://dx.doi.org/10.1016/j.amepre.2016.05.001>.
- Perini, S., Titov, N., Andrews, G., 2009. Clinician-assisted Internet-based treatment is effective for depression: randomized controlled trial. *Aust. N. Z. J. Psychiatry* 43:571–578. <http://dx.doi.org/10.1080/00048670902873722>.
- Richards, D., Richardson, T., 2012. Computer-based psychological treatments for depression: a systematic review and meta-analysis. *Clin. Psychol. Rev.* 32 (4):329–342. <http://dx.doi.org/10.1016/j.cpr.2012.02.004>.
- Romijn, G., Riper, H., Kok, R., Donker, T., Goorden, M., van Rooijen, L.H., ... Koning, J., 2015. Cost-effectiveness of blended vs. face-to-face cognitive behavioural therapy for severe anxiety disorders: study protocol of a randomized controlled trial. *BMC Psychiatry* 15:311. <http://dx.doi.org/10.1186/s12888-015-0697-1>.
- Ruwaard, J., Schrieke, B., Schrijver, M., Broeksteeg, J., Dekker, J., Vermeulen, H., Alfred Lange, A., 2009. Standardized web-based CBT of mild to moderate depression: a randomized controlled trial with a long-term follow-up. *Cogn. Behav. Ther.* 38, 206–221.
- Ruwaard, J., Lange, A., Schrieke, B., Dolan, C.V., Emmelkamp, P., 2012. The effectiveness of online cognitive behavioral treatment in routine clinical practice. *PLoS One* 7 (7), e40089. <http://dx.doi.org/10.1371/journal.pone.0040089>.
- Stallard, P., Richardson, T., Velleman, S., 2010. Clinicians' attitudes towards the use of computerized cognitive behaviour therapy (cCBT) with children and adolescents. *Behav. Cogn. Psychother.* 38 (5):545–560. <http://dx.doi.org/10.1017/S1532465810000421>.
- Titov, N., Dear, B.F., Staples, L.G., Bennett-Levy, J., Klein, B., Rapee, R.M., ... Niessen, O.B., 2016. The first 30 months of the MindSpot clinic: evaluation of a national e-mental health service against project objectives. *Aust. N. Z. J. Psychiatry* <http://dx.doi.org/10.1177/0004867416671598> (in press).
- van der Vaart, R., Witting, M., Riper, H., Kooistra, L., Bohlmeijer, E.T., van Gemert-Pijnen, L.J., 2014. Blending online therapy into regular face-to-face therapy for depression: content, ratio and preconditions according to patients and therapists using a Delphi study. *BMC Psychiatry* 14 (1):355. <http://dx.doi.org/10.1186/s12888-014-0355-z>.
- Vis, C., Kleiboer, A., Prior, R., Bønes, E., Cavallo, M., Clark, S.A., ... Riper, H., 2015. Implementing and up-scaling evidence-based eMental health in Europe: The study protocol for the MasterMind project. *Internet Interv.* 2 (4):399–409. <http://dx.doi.org/10.1016/j.invent.2015.10.002>.
- Vos, T., Barber, R.M., Bell, B., Bertozzi-Villa, A., Biryukov, S., Bolliger, I., et al., 2015. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 386 (9995):743–800. [http://dx.doi.org/10.1016/S0140-6736\(15\)60692-4](http://dx.doi.org/10.1016/S0140-6736(15)60692-4).
- Wentzel, J., van der Vaart, R., Bohlmeijer, E.T., van Gemert-Pijnen, J.E., 2016. Mixing online and face-to-face therapy: how to benefit from blended care in mental health care. *JMIR Ment. Health* 3 (1), e9. <http://dx.doi.org/10.2196/mental.4534>.
- WHO, 2008. Global Burden of Disease: 2004 Update. (Retrieved from). World Health Organization, Geneva http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf.
- WHO, 2013. Mental health action plan 2013–2020. (Retrieved from Available from URL). http://apps.who.int/iris/bitstream/10665/89966/1/9789241506021_eng.pdf.